

Notes on the Systematy of Malayan Phanerogams

XVIII — XXII *

by

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Abstract

Calophyllum austrocoriaceum and *C. rupicolum* var. *elatum* are new taxa. *C. intramarginale* is reduced to *C. inophylloide* var. *singaporense*.

A division of Malayan *Garcinia* into groups is described. *G. burkillii*, *G. cantleyana* and its var. *grandifolia*, *G. cataractalis*, *G. hendersoniana* and *G. murtonii* are new species. *G. dumosa* (and its Malayan allies), *G. nigrolineata*, *G. penangiana*, *G. bancana*, *G. opaca* and *G. pyrifera* are annotated with several new synonyms proposed; *G. opaca* var. *dumosa* is proposed as a new variety.

In *Mesua* notes are provided on the alliances of *M. assamica*, *M. elegans*, *M. kunstleri* and *M. lepidota*; and *M. kochummeniana*, *M. nivenii*, *M. nuda* and *M. purseglovei* are new species.

Barringtonia payensiana is a new species.

Crudia viridiflora is a new species, with simple leaves.

In Olacaceae, *Strombosia maingayi* is shown to be the legitimate name for the tree long known as *S. rotundifolia*; the differences from *S. multiflora* are discussed.

In Proteaceae, *Heliciopsis cockburnii*, *H. montana* and *H. whitmorei* are described as new species.

This fourth instalment of our series of notes completes the taxonomic groundwork for volume 2 of the *Tree Flora of Malaya*, which takes the project over the half way mark. The longest note is on the Guttiferae, mainly *Garcinia*, the second biggest family (after Euphorbiaceae) treated in volume 2. Yet another new leguminous species has been discovered, this time a simple-leaved *Crudia*. Once again we express our thanks to Dr. B. C. Stone for help with the latin descriptions.

XVIII. GUTTIFERAE

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Calophyllum

Calophyllum austrocoriaceum Whitmore sp. nov.

C. sp. 10 in Henderson & Wyatt-Smith Gdns' Bull. Sing. 15 (1956) 313, plate VIII, Fig. 3 E.

Arbor parva, ramulis crassis, laevibus, leviter complanatis, furfuraceis; gemmis terminalibus crassis, lanceolatis, acutis, subtiliter tomentosis, usque 15 mm longis, foliis valde coriaceis, oblongis vel anguste ovate-ellipticis (7 × 3) – 11 × 3 – 16 × 5 cm, apice rotundato vel obtuso, base cuneato, leviter decurrenti, costa lato

* continued from *Gdns' Bull. Sing.* 26: 49–61.

pagina infera prominenti pagina supra prope basim interdum canaliculato, nervis utrinque conspicuis subdistantibus, petiolo 2–3 cm crasso. *Inflorescentiae* axillares pauciflorae. *Flores* ignoti. *Fructus* subglobosa, usque 23 mm longa apiculata, pericarpio crasso duro siccitate brunneo sublaevi, pedicello crasso 1 cm, pedunculo crasso 15 mm.

JOHORE: G. Panti *FRI* 7846 (holotype KEP); *FRI* 7729, 13819, *SFN* 29969; G. Belumut *KEP* 98038, *FRI* 7512, 7789, 8722, 8809.

Not seen: *SFN* 10723, cited by Henderson and Wyatt-Smith.

This is close to *C. coriaceum* of the mountains of the Main and east coast ranges and replaces it on the southernmost mountains of the Peninsula. The name is chosen to reflect this affinity. It is also closely related to *C. tahanense* of G. Tahan. From both of its relatives *C. austrocoriaceum* conspicuously differs in the nerves being prominent and coarse on both surfaces, the short, few-flowered, axillary racemes and the apiculate unbeaked fruit.

Calophyllum inophylloide* var. *singaporense Henderson et Wyatt-Smith Gdns' Bull. Sing. 15 (1956) 316, plate IX, Fig. 4 D-H.

C. intramarginale Henderson et Wyatt-Smith loc. cit. 342, plate XXII, Fig. 13A, B. **syn. nov.**

The latter species is said to differ in its smaller leaves with intramarginal vein, shorter inflorescences with all the flowers apical on the peduncle, and its montane habitat.

It appears that Henderson and Wyatt-Smith drafted the monograph when only the type of *C. intramarginale* was known, a collection from a small tree from 4000 ft on G. Padang; and that *KEP* 67753, from 1020 ft in Rasau Kerteh F.R., was added later, but neither the key nor notes were amended to allow for its lowland station.

I have since made a second collection from G. Padang (*FRI* 12644) in which the intramarginal nerve is very difficult to see. Three other collections have recently been made which have an intramarginal nerve on one or a few leaves (*FRI* 4114, 8839, 10840) and these are all big trees which in leaf shape, bark, exudate colour and the possession of buttresses resemble *C. inophylloide* var. *singaporense*. They come from W. Kelantan, N. E. Johore and Trengganu respectively.

The flowers of *C. inophylloide* var. *singaporense* arise in a cluster from the top of the peduncle and sometimes, on long racemes, there are also 1–2 lateral pairs. In *C. intramarginale* these lateral pairs are always lacking.

I do not believe *C. intramarginale* can be maintained and therefore reduce it.

C. inophylloide var. *singaporense* differs mainly from the typical variety in its smaller leaves.

Calophyllum rupicolum* var. *elatum Whitmore **var. nov.**

C. rupicolum var. in HENDERSON & WYATT-SMITH Gdns' Bull. Sing. 15 (1956) 347, plate XXVII, Fig. 13 M, N.

A varietas typica elatiore usque 18 m, in *foliis* maioribus, latioribus, 8 × 2.7 – 11 × 3.5 cm, differt.

KELANTAN: *FRI* 2538 (holotype of var. at KEP). TRENGGANU: Ulu Brang *FRI* 15256. G. Tebu F. R. *FRI* 2513, 2516. Bt. Rambai F. R. *FRI* 11401. KEDAH: Ulu Muda F. R. *FRI* 6757. PAHANG: Rompin *KEP* 29648. PERAK: Dindings, Telok Kopia F. R. *FRI* 3105. JOHORE: Kangka Sedili Kechil, Corner s.n. 17. VI. 34; Mawai, *SFN* 34706, 34747.

Henderson & Wyatt-Smith left this as an undescribed variety. More material has now been collected and I feel confident in describing it, but as a variety of the river-bed bush *C. rupicolum* and not as a full species. Apart from the relatively broader leaves, and the habit and habitat it comes very close to *C. rupicolum*, and there is some overlap in leaf.

All the collections are of small trees away from rivers except *FRI* 12526, described as a riverside bush, yet with leaves 11×3.5 cm, the largest seen.

I have studied *C. rupicolum* on the Sg. Tahan near K. Tenor. There it grows as a small, sinuous tree to 6 m tall on earth river banks at shingle shallows. Leaf size was greatest at the top of the crown and tiny at the crown base, below the level of the highest floods. The collection, *FRI* 15985, clearly shows the narrow leaves of the typical variety, they are up to 8 cm long.

Garcinia

I have found it useful to divide Malayan *Garcinia* into six groups, named A-F, based on the structure of the male flower. These groups are a refinement of the numbered sections proposed by King in the key to his account in the Materials (*J. As. Soc. Beng.* 59, 1890, 148-72) and which were more or less copied by Ridley in his *Flora* (1, 1922, 167-80). To some extent they are natural, though groups B and C very probably are not (species of subgroups Bi and Ci are very similar and easily confusable). A guide to the groups in the form of a key appears in my account for the *Tree Flora* and this should also be consulted. It must be emphasised that the groups are informal ones, and are based on a study only of Peninsula material; they are published here because I believe they might perhaps provide a useful starting point for other students of this big and intricate genus, but they certainly should not be regarded as definitive statements on the taxonomy of the whole of *Garcinia*. The subgroups, where such are defined, are species which are closely similar in one or several respects, i.e. 'circles of affinity', and not all species fall into clear subgroups. Further notes on individual species, including the subgroups, can be found in the *Tree Flora*.

In these studies I have not found helpful the groupings proposed by Anderson (in Hk. f. *Fl. Brit. Ind.* 1, 1884, 259-70) or those proposed by Pierre (*For. Fl. Cochinch.* 1, 1883, i-xlii).

The groups are defined on the structure of the male flower. Other characters common to the component species are also given in the descriptions below. There is a final artificial group, G, of 3 incompletely known species.

Group A. Sepals and petals 4. Stamens numerous, on 4 fleshy processes, anther cells 2 (4 in *G. cuspidata*, fide King), pistillode present.

Subgroup Ai. Leaves reminiscent of *Eugenia*, with fine, rather close, parallel, secondary nerves arising nearly at right angles to the midrib. Flowers small, in small inflorescences or clusters, axillary or behind the leaves.

G. cuspidata King, *G. eugeniaefolia* Wall., *G. merguensis* Wight, *G. rostrata* Wall., *G. sp. A1*.

A closely knit alliance for which I have only been able to give a provisional account; species delimitation needs a critical reappraisal on a monographic basis. See also the notes under *G. rostrata* below.

The following species, dissimilar from each other and from members of the Subgroup Ai, are also in group A:

G. diversifolia King, *G. holttumii* Ridley, *G. monantha* Ridley, *G. murtonii* Whitmore, *G. sp. A2*, *G. sp. A3*.

Group B. Sepals and petals 4. Stamens numerous, joined in a sometimes 4-lobed ring, surrounding a central pistillode; anther cells 2. Flowers terminal, males several, females solitary.

Subgroup Bi. Most easily defined as a close knit alliance of spp. extremely similar to the well known mangosteen; virtually indistinguishable when sterile and differing most noticeably in stigma.

G. hombroniana Pierre, *G. malaccensis* Hk. f., *G. mangostana* L.

Species of this alliance occur throughout the East Indies, the best taxonomic treatment of the variation remains to be ascertained from a monographic base.

Subgroup Bii. *G. costata* Hemsley ex King, *G. maingayi* Hk. f. Two species similar in their coarsely ribbed leaves.

Subgroup Biii. Male flowers in a short, terminal raceme, females solitary. Leaves drying thin, green-black.

G. atroviridis Griff ex T. Anders. Very distinctive.

Group C. Flower structure just as in Group B but with no pistillode, so the stamens as a central mass. Flower position various.

Subgroup Ci. Flower position as in Group B. Leaves drying with a distinct reddish or orange tint.

G. murdochii Ridley, *G. opaca* King, *G. penangiana* Pierre, *G. sp. C1* (?).

This Subgroup is very close to Bi above. It is discussed further below, under *G. penangiana*.

Subgroup Cii. Flowers mostly behind the leaves, in clusters. Leaves leathery, drying with a distinct reddish tint, or drying thin and green to green-black in *G. forbesii*, *G. griffithii*.

G. bancana (Miq.) Miq., *G. clusiaefolia* Ridley, *G. forbesii* King, *G. griffithii* King, *G. sp. C2*.

Subgroup Ciii. Leaves with rather open, reticulate nervation, drying brown-green. Flowers minute, in axillary racemes.

G. minutiflora Ridley.

Not placed: *G. montana* Ridley.

Group D. Sepals and petals 4. Stamens numerous, as a central mass; no pistillode; anther cells 4. Flowers small, in clusters in axils and behind leaves. Leaves drying thin, commonly pinkish grey-brown and with a fine pattern of black dots and dashes.

G. cowa Roxb., *G. nigrolineata* Planch. ex T. Anders., *G. parvifolia* (Miq.) Miq.

Corner (*Gdns' Bull. Str. Settl.* 10, 1938, 36-8) sorted out the Malayan members of this small group.

Group E. Sepals and petals 4. Stamens not very numerous, connective peltate with the anther cells marginal, often confluent, their dehiscence circumscissile; pistillode absent. Fruits thinly woody. Leaves often drying greenish.

Subgroup Ei. Flowers and fruits clustered on small tubercles, axillary and behind the leaves. Leaves usually thin. Often small shrubs.

G. dumosa King, *G. scortechinii* King, *G. urophylla* Scortechini ex King, *G. sp. E3*.

This Subgroup is discussed below, under *G. dumosa*.

Subgroup Eii. Fruits solitary, mainly in leaf axils, some behind the leaves. Leaves usually leathery. Mainly mountains.

G. burkillii Whitmore, *G. cantleyana* Whitmore, *G. hendersoniana* Whitmore, *G. uniflora* King, *G. sp. E1* (?), *G. sp. E2*.

This Subgroup shows partly allopatric, partly sympatric distribution patterns in the mountains which are discussed in the *Tree Flora*.

Group F. Sepals and petals 5. Stamens in 5 bundles around a small central pistillode. Male and female (and hermaphrodite ?) flowers sometimes mixed. Fruits usually drying shiny brown-black, intricately, sinuously wrinkled. Leaves commonly drying with a greenish or yellowish tinge.

G. dulcis (Roxb.) Kurz, *G. nervosa* (Miq.) Miq., *G. prainiana* King, *G. pyrifera* Ridley, *G. xanthochymus* Hk. f.

Long recognised, and at one time gave generic status as *Xanthochymus* Roxb.

Group G. Incompletely known species.

G. cataractalis Whitmore, *G. sp. G1*, *G. sp. G2*.

***Garcinia burkillii* Whitmore sp. nov.**

Arbor parva, foliis subcoriaceis, ovatis 7.5 × 4.5 – 15 × 7 cm, acutis, base late cuneato vel rotundato, minime decurrenti, siccitate fuscis, marginibus leviter recurvatis, nervis lateralibus tenuibus. *Flores* ignoti. *Fructus* axillaria solitaria ovoidea, 2 cm longa, usque ad 12 mm diam., siccitate castanea, laevia, tenuiter lignosa, cum sepalis persistentibus ovatis 6 mm latis longisque, stigmatibus integro tholiformi 3 mm diam. subsessili subtiliter papillato, axillari, solitario.

TRENGGANU: Sg. Loh, K. Datok, *FRI 12003*. PAHANG: Tahan River, *Ridley 2239*; *G. Tapis FRI 10911* (holotype KEP).

In leaf this is close to *G. uniflora* King of the Main Range, to which I believe it is related (though the flowers remain unknown). The fruiting stigma is, however, quite different. It is also quite clearly a very close relative of *G. hendersoniana* described below, and differs mainly in the fruit and its stigma.

***Garcinia cantleyana* Whitmore sp. nov.**

Arbor parva, foliis parvis, crasso coriaceis, ovatis, 5.5 × 3 – 10 × 5 cm, apice late rotundato interdum apiculato, base late cuneato, marginibus valde revolutis; nervis lateralibus tenuissimis, petiolo crasso 14 mm. *Flores* (femineis ignotis) in

axillas foliorum delapsorum poxiti, sessiles, sepalis 4 ovatis 4×4 mm, petalis 4 quam sepalis aliquantam minoribus, masculi cum staminibus numerosis androecium globosum centralium formantibus, filamentis crassis 1 mm, antheris peltatis 1 mm latis rima lata dehiscentibus, filamentis 1 mm longis spissibus, pistillodio nullo. *Fructus* subglobosa 3 cm diam., siccitate brunnea, sessilia, calyce persistenti lignoso insidens, stigmatis 3 mm diam. integro tholiformi grosse papilloso sessili.

PAHANG: Fraser's Hill, *FRI* 5819 (holotype KEP). PERAK: G. Korbu, *SFN* 16301, *KEP* 45976; Cameron Highlands, *SFN* 20603.

***G. cantleyana* var. *grandifolia* Whitmore var. nov.**

A varietate typica in *foliis* maioribus, 17×10 cm, *fructibus* interdum ovoideis differt.

PAHANG/SELANGOR: crest of Main Range, road to G. Ulu Kali, *FRI* 12576 (holotype KEP), *FRI* 16185.

***Garcinia cataractalis* Whitmore sp. nov.**

Frutex humilis, foliis lineari — lanceolatis 6×0.5 cm. *Flores* ignoti. *Fructus* axillaria, carmina, subglobosa, 2–3 lobata, vivo 2.5 cm diam. (siccitate valde vietus, grosse rugosa, 1.5 cm diam.), valde 8 mm rostrata, stigmatibus nigro 4 — lobato undulato minute papilloso leviter procurenti, seminibus valde complanatis in pulpa aquosi translucenti inclusis.

TRENGGANU: Sg. Kerbat at Jeram Petang: *FRI* 20350 (holotype KEP); Sg. Nipah at Jeram Gajah: *SFN* 25913.

Well known to the local boat men on the Sg. Kerbat as *gelugor batu*; a highly distinctive rheophyte.

***Garcinia dumosa* King**

G. tenuifolia Ridley Kew Bull. (1928) 72 syn. nov.

***Garcinia scortechinii* King**

G. gaudichaudii var. *minor* Ridley Flora 1 (1922) 177 syn. nov.

***Garcinia urophylla* King**

All King's three species were described in the Materials (*J. As. Soc. Beng.* 59, 1890, 166–8). They are only weakly differentiated by the descriptions. The only syntype at Singapore is a sheet of *Curtis* 1249, *G. scortechinii*. I am able provisionally to maintain these species on the weak differential characters given in the *Tree Flora* but they are undoubtedly close, with apparently little difference in their reproductive parts. A monographer will have to reconsider this group together with its Indo-Chinese relatives. I do not see that Ridley was justified in reducing *G. scortechinii* to the Indo-Chinese *G. gaudichaudii* Planch. et Triana, as he did not make the necessary critical comparative studies of this whole alliance, I therefore do not follow him and, further, I reduce his var. *minor* of *G. gaudichaudii* to synonymy, having seen the Johore syntype. *G. tenuifolia* from the islands off Pahang is simply superfluous, I see no difficulty in reducing this species to *G. dumosa*.

***Garcinia hendersoniana* Whitmore sp. nov.**

Arbuscula vel arbor parva, *foliis* percoriaceis, ovatis, $8 \times 5.5 - 14 \times 8.5$ cm, apice acuto, base late cuneato vel rotundato, marginibus revolutis, nervis lateralibus tenuibus attamen manifestis, petiolo 1–2 cm longo. *Flores* (masculis ignotis) sessiles, solitarii, in axillas foliorum delapsorum poxiti, sepalis 4 ovatis, exterioribus (2) 9×8 mm, interioribus (2) 5×8 mm, petalis 4 ovatis unusquisque 5×5 mm, staminodiis peltatis circulatim dispositis, ovario cylindrico 4 mm longo $\times$ 3 mm diam., stigmate sessili tenui integro circulari-discoideo paullo convexo grosse papilloso paullo projectenti 4 mm diam. *Fructus* (? immaturi) ampulliformia vel rotundata, 3 cm longa, siccitate nigro-cinerea laevia, tenuiter lignosa, sepalis persistentibus.

TRENGGANU: G. Padang *SFN* 31065, 31824; *FRI* 12718; G. Mandi Angin *FRI* 10813 (holotype KEP), *FRI* 10826, 12103. PAHANG: G. Tapis *FRI* 10994. PAHANG/SELANGOR: G. Ulu Kali *FRI* 16206.

***Garcinia murtonii* Whitmore sp. nov.**

Frutex vel arbuscula, vel arbor parva, *foliis* glabris, coriaceis, ellipticis vel ovato-ellipticis, $5 \times 2 - 8 \times 3.8 - (8.5 \times 4.5)$ cm, apice acuto, base longe cuneato, leviter decurrenti, nervis lateralibus approximatis (inter se 2 mm) parallelis rectis prope marginem bifurcatis gracilis utrinque prominentibus, costa striato utrinque prominenti. *Flores* (masculi) in racemis *c.* 1 cm longis congestibus, spissibus, axillaribus aggregatis, pedicellis 2 mm longis, sepalis 4 ovatis 2 mm latis caduceis, petalis 4 simillimis, staminibus in 4 fasciculos dispositis, pistillodio fungiformi. *Flores* feminei ignota. *Fructus* globosa, 2 cm diam., nigricans, laevia, stigmate disciformi aliquantam quadrato integerrimo grosse papilloso 2 mm diam. prominulenti, sepalis nec persistentibus caduceis.

JOHORE: G. Belumut, *KEP* 33830, *KEP* 33850 (holotype KEP), *FRI* 7511, 8730, 8737, 17825, *SFN* 10990. PERAK: G. Korbu, *KEP* 31486.

***Garcinia nigrolineata* Planch. ex T. Anders. Fl. Brit. Ind. 1 (1874) 263.**

G. kunstleri King J. As. Soc. Beng. 59 (1890) 165 **syn. nov.**

King cites collections by Wray and Scortechini. Ridley (*Flora* 1, 1922, 177) adds no others. I have seen at Singapore Wray 828, Scortechini 271, 1852 and s.n., probably all the syntypes. The fruit is not grooved and ridged, the stigma is 2.5 – 3.5 mm wide, papillose and slightly raised, but not on an umbo; the female flowers are 3 mm across on slender, 5 mm pedicels and contain a globose, very young fruit. *G. kunstleri* has not been recollected. Apart from the very small female flowers it fits well Corner's diagnosis of *G. nigrolineata* in *Gdns' Bull. Str. Settl.* 10 (1938) 36–8, and I have little hesitation in suggesting that it is but a weakly differentiated form of that species, best reduced to synonymy.

On the Scortechini sheets I have seen have no locality notes. I do not know what led Ridley (loc. cit.) to say they came from the big limestone hill at Kuala Dipang. There is no limestone near Tapah, the Wray locality.

The *G. penangiana* group (Group C)

Pierre (*Fl. For. Cochinch.* fasc. 6, 1883, 37) described *G. penangiana* from Wallich's collector (Porter) 4852D, a collection with male flowers in bud. He pointed out that Hooker had already mentioned it as distinct from *G. cornea* L. in a parenthetical addition to Anderson's account of *Garcinia* in *Fl. Brit. Ind.* 1

(1874) 260. King saw further collections and amended the description in his account of *Garcinia* in the Materials (*J. As. Soc. Beng.* 59, 1890, 158). I follow what I believe to be King's circumscription, although he does not precisely state which collections he saw, except for *Kunstler* 3853, which is not at Singapore.

I have examined at Bogor, *Teysmann* s.n. from Riouw, P. Bientang, the type of *G. caloneura* Boerl. *Cat. Hort. Bot. Bogor* 68 (2) 1901. It looks very similar to *G. penangiana*.

Dr. Kostermans has for some years now been labelling as *G. celebica* L. all specimens of this species-group in the herbaria he has visited.

All these species are of very similar appearance and I see no prospects of resolving their limits without monographic study.

There has been confusion between the *G. penangiana* group and the *G. hombroniana* alliance, my Subgroup Bi; this might indicate close affinity, implying that, as I indeed suspect, my species-groups, although convenient, are not entirely natural aggregates.

G. bancana (Miq.) Miq. *Fl. Ind. Bat. Suppl.* (1861) 494. ***G. bancana* var. *curtisii*** (Ridley) Whitmore **stat. nov.**

Basionym of variety: *G. curtisii* Ridley, *Flora* 1 (1922) 175, quoad syntypus *Curtis* 691 = lectotypus.

G. curtisii Ridley differs from *G. bancana*, after which Ridley places it in his *Flora*, consistently in the fruits with the stigma protruding, more or less lobed and more or less coarsely papillose. The leaves tend to be narrower and are consistently pointed. It is undoubtedly very closely related and I reduce it to a variety. The fruits are exactly like those of *G. penangiana* which, however, always has its flowers borne terminally; in this variety a few are terminal, but most are in fascicles behind the leaves, as in *G. bancana*.

I have selected one of the syntypes as lectotype of my variety. The other, *Curtis* 240, is typical *G. penangiana*.

Collections seen:

PENANG: *Curtis* s.n. May 1880, s.n. July 1890, 677; *SFN* 3034, 35322. JOHORE: *SFN* 25854. SINGAPORE: *Ridley* 6194.

I provisionally also place *FRI* 4150 from W. Kelantan here, though it differs in its fruits drying less wrinkled and with sunken stigma.

Garcinia opaca King *J. As. Soc. Beng.* 59 (1890) 160.

Apparently a rare species. I have not seen the syntype(s) from which King described the flowers; *King's Collector* 5460 at Singapore, which I believe to be a syntype, is in fruit.

G. opaca closely resembles *G. hombroniana* but (fide King) has no pistillode in the male flower, thus it falls in my Group C, whereas *G. hombroniana*, with pistillode, falls in Group B. As already noted I am not convinced B and C are natural groups, although they are very convenient ones. Both these species have the fruit wall thinly woody, and tending to fracture in the herbarium, this feature is more marked in *G. opaca* and especially so in its var. *dumosa* described below. Typically, *G. hombroniana* has a depressed globose fruit with the stigma on a distinct apical umbo, but sometimes the fruit is slightly elongate. In what I have

described as variety A (see *Tree Flora*) the fruit is much longer than broad as in *G. opaca*, but I am not sure of the true affinity of this variety; its flowers have yet to be found.

***G. opaca* var. *dumosa* Whitmore var. nov.**

A varietas typica in *habitu* plerumque fruticoso, *foliis* minoribus, ellipticis, $9 \times 3.5 - 13 \times 5 - 17 \times 7$ cm, petiolo graciliore brevior, 8–10 mm, *calyce* in *fructu* parvo demum cadenti, differt.

PAHANG: Bt. Terom, Ulu Keniyam *Mohd. Shah 1560* (holotype SING); *G. Benom* KEP 97842; Chini F. R. *FRI 11066*. JOHORE: Bt. Kuing *SFN 28653*; S. Berassau, *Corner* s.n. 18.IV.32; *G. Chabang Tiga Jumali & Heaslett 4114*; Mersing, Sg. Sarah working circle, *KEP 77731*. SELANGOR: Genting Sempah *KEP 10941*.

KEP 97842 is a tree, all the others are shrubs, except that the sheet I have seen (at SING) of *KEP 10941* has no note on stature.

***Garcinia pyrifera* Ridley J. Str. Br. Roy. As. Soc. 73 (1916) 140 (sphalm 'pyriferum').**

G. densiflora King J. As. Soc. Beng. 59 (1890) 171 (non *G. densiflora* Vieill. ex Pierre Fl. For. Cochinch. 5 (1883) 25) **syn. nov.**

Ridley noted that his species was close to King's except for certain foliage differences which he specified. I have compared the type of *G. densiflora* (King's *Collector 5933*) with that of *G. pyrifera* (Curtis 3094) and all the subsequent gatherings of the latter and can see no good differences, though two of the three leaves of the Singapore sheet are oblong-ovate, an unusual shape.

In *Flora* 1 (1922) 179 Ridley reduced King's species to *G. glomerata* Vesque (in DC. Monog. Phan. 8 (1893) 320), which predates his own *G. pyrifera*. I have been unable to check this because there is no authentic material of *G. glomerata* at Singapore or Bogor. Provisionally therefore I recognise *G. pyrifera* as the name for this tree.

The flowers of *G. pyrifera* remain unknown. The description in the *Tree Flora* is taken from King's of *G. densiflora* flowers, so far as I could confirm it from the poor specimen at Singapore.

G. pyrifera is a species with the Gestalt of the other Malayan species of the *Xanthochymus* group (*G. nervosa*, *G. dulcis*, *G. prainiana*) and quite clearly distinct from them in detail.

***Garcinia rostrata* and its allies (Subgroup Aii)**

✓ ***Garcinia rostrata* (Hassk.) Miq. Ann. Mus. Bot. Lugd. Bat. 1 (1864) 209.**

G. wrayi King J. As. Soc. Beng. 59 (1890) 152, **syn. nov.**

***Garcinia eugeniaefolia* Wall. ex T. Anders. Fl. Brit. Ind. 1 (1874) 268.**

I provisionally keep *G. rostrata* and *G. eugeniaefolia* apart, not having seen the types of the former, on the stigma differences given by King, which are 'flat to concave, smooth' and 'flat to domed, papillose' respectively. The two syntypes of *G. wrayi* at Singapore (*Wray 267, 362*) show it clearly belongs to this aggregate. Unfortunately all the flowers have fallen; King's description of the stigma as

'hemispheric, smooth, entire' (my italics) suggests it belongs with *G. rostrata*. Ridley (in *Flora* 1, 1922, 169) reduced *G. wrayi* to *G. merguensis*, but I believe that is a fairly distinct species (see key in the *Tree Flora*) on foliage as well as flowers and that my placing of it is more probably correct. This whole complex, my Subgroup Ai, needs careful monographic investigation.

✓ ***Garcinia merguensis*** Wight Illustrations of Indian Botany (1831) 122.

G. lanceolata Ridley *Flora* 1 (1922) 170, **syn. nov.**

I have examined the material at Kew, Kepong and Singapore and believe these two to be the same.

Mesua

The *Mesua assamica* group

Mesua* aff. *assamica (King et Prain) Kosterm.

Kayea assamica King et Prain Ind. Forester 27 (1901) 62.

Symington first recorded this for Malaya when, at Kew in July 1939, he matched *KEP* 4643 (sterile), *KEP* 5495 (fruiting) and possibly *KEP* 10600 to *H. G. Young* s.n. December 1899 and 29 June 1900, two of the syntypes of *K. (M.) assamica*. Symington (ms. notes preserved at Kepong) observed "These, I think, differ [from *M. ferruginea*]. They are not riparian trees and the fruits are probably smaller than *K. (M.) ferruginea*. They more closely resemble *K. (M.) assamica* K. et P. than anything else but the leaves are less cuneate and acuminate and the venation [sic] is less conspicuously dryobalanoid".

I have placed a whole group of collections here which match *KEP* 4643 and 5495 in leaf, habit, habitat, and most especially in having the fruit enclosed in two, strongly adpressed, enlarged sepals. The fruits are long-stalked and solitary in 5495 but in open panicles in most of the new collections. King and Prain describe *K. assamica* as possessing panicles 3–6 in. long. The size of the fruit varies, as does the sepal surface texture and, slightly, the shape. I attach no importance to variation in the degree of splitting of the 2 sepals which I believe to be developmental.

I have not seen the types of *K. (M.) assamica*, and following the caution expressed by Symington, name our material as aff. *assamica*. It is slightly heterogeneous but is held together by the nature of the fruiting calyx, and, though further collections may reveal it to comprise more than one taxon, I have little doubt all these collections are related.

FRI 12033 is an anomalous high altitude collection (780 m, G. Mandi Angin) with possibly galled young fruits which, on present evidence, comes here; and the sterile collection *FRI* 9347, from 960 m on G. Inas, Kedah matches it in leaf.

I have segregated from the above a number of sheets as *Mesua* sp. D. These puzzle me not a little. They differ in having smaller leaves with more slender stalk, and smaller fruits, also more slenderly stalked. Fuller descriptions are given in the *Tree Flora*. At the extreme this taxon is rather distinct and *KEP* 110395, *FRI* 2617, 8106 approach *S21745*, 22469, 22507 from Sarawak named by Ashton (unpublished ms.) as *M. acuminatissima* (Merrill) Kosterm., but it merges into typical Malayan *M. aff. assamica*. Two collections, *FRI* 8851, 10891, have the fruits solitary, the other collections have panicles.

The problems of this species-group can only be finally resolved by a monographer who will, I suspect, need more collections than yet exist.

Collections seen:

M. aff. assamica

KEDAH: *FRI* 9347. KELANTAN: *FRI* 4054, 4099. TRENGGANU: *Corner* s.n. 7 Nov. 35, 12 Nov. 35, *FRI* 12033. PAHANG: *KEP* 4643, 5495, 77710.

JOHORE: *Kiah* s.n. 19 Oct. 35, *SFN* 25973, 26140, 29272, *Lake & Kelsall* s.n., 28 Oct. 1892.

M. sp. D.

PAHANG: *G. Tapis* *FRI* 10071, 10115, 10891; *FRI* 8106. JOHORE: *KEP* 110395, *FRI* 2617, 8851.

In the absence of flowers or fruits collections of the *M. assamica* group from Malaya are very difficult to distinguish from *M. ferruginea* on morphology. On the basis of size and habitat the following collections of fallen leaves are put under the *M. assamica* group:

M. aff. assamica

TRENGGANU: *KEP* 81070, 93779. KEDAH: *KEP* 81329. NEGRI SEMBILAN: *KEP* 105202. JOHORE: *FRI* 5088.

M. sp. D.

SELANGOR: *KEP* 76378.

Mesua sp. E.

Possibly this is another relative of *M. assamica* from which it differs conspicuously in the shiny leaves with very faint nervation and not or scarcely reticulate. *KEP* 94924 has remarkable fruits enclosed in 2 big woody sepals plus, alternating with them, 2 lanceolate ones. In other respects this collection seems similar to *KEP* 76086 with fruits with the type of calyx found in *M. aff. assamica*. *FRI* 8125 is again similar in leaf. Its flowers are larger than in the collections of *M. aff. assamica*.

The taxon is known from the east coast as follows:

TRENGGANU: Bt. Bauk: *KEP* 76086.

PAHANG: Bt. Beserah: *KEP* 94924; Ulu Sg. Anak Endau: *FRI* 8125.

Mesua elegans (King) Kostermans Reinw. 7 (1969) 427.

Kayea elegans King J. As. Soc. Beng. 59 (1890) 183 basionym

Kayea caudata King loc. cit., **syn. nov.**

Mesua caudata (King) Kostermans loc. cit. 426, **syn. nov.**

The leaves of *M. elegans*, based on one flowering collection (King's Collector 7346, K!), differ from those of *M. caudata*, based on one fruiting collection (King's Collector 7937, K!). They are lanceolate, tapering gradually into a pronounced drip tip, the secondary nerves are faint, and a fine, faint reticulum can be made

out with the aid of a lens on the undersurface. The leaves of the type collection of *M. caudata* are much broader, taper suddenly into a drip tip, have the secondary nerves prominent, and the reticulum is almost invisible. In both, the leaves dry khaki-brown, the twigs are slender and tiny, and subulate 'stipules' and hypophylls are present.

The two species are close, but on these collections they can be distinguished, as indeed King does distinguish them in his key.

The numerous gatherings which have been made since 1885 show a complete range of intermediates, and I do not believe that more than one species exists. I have chosen to call it *M. elegans* because other species of *Mesua* in Malaya also have caudate leaves.

M. elegans is in many ways a delicate version of *M. kunstleri*.

Collections seen (all at KEP and SING except the types):

PERAK: Batang Padang district: *King's Collector* 7937 (type of *K. caudata*), G. Bubu: *King's Collector* 7346 (type of *K. elegans*); Keladang Saiong F. R.: *FRI* 5998; Parit F. R.: *KEP* 39492; Tapah: *Ridley* 14085. SELANGOR: Ulu Langat: *FRI* 12203; Klang Gates: *KEP* 532, 33224, 47132, *Ridley* 13521, 13527. PAHANG: Kemasul F. R.: *KEP* 10608, 10876. JOHORE: G. Panti: *KEP* 99232. SINGAPORE: Garden's Jungle: *Furtado* s.n. 13 I 1931, *Ahmad* s.n. 10 III 1926.

***Mesua kochummeniana* Whitmore sp. nov.**

Arbor magna, usque ad 36 m alta, 3 m diametro, ligno duro (ferreo); ramulis crassis angulosis subsparsae squamatis, *foliis* ovato-oblongis, c. 22 × 9 cm, base rotundatis, apice rotundato-apiculatis, marginibus revolutis, laminis infra glaucis, supra nitide castaneis, nervis lateralibus approximatis parallelis, ex costa subperpendicularibus, leviter curvatis, distaliter incurvato-approximatis arcuatis, petiolo crasso rugoso c. 12 mm longo. *Inflorescentia* racemosa, racemis 3–10 terminalibus, 4–7 cm longis, 3–6 floriferis, *floribus* subapicalibus, pedicellis 5 mm longis, bracteolis 1 mm longis oppositis dettoideis; sepalis 4 ovatis 6 mm longis, petalis caducis (non vidi), staminibus caespitosis exsertis, filamentis tenuibus 7 mm longis. *Fructus* (probabiliter immaturi) c. 3 cm diametro, includentibus in sepalis duobus globosis truncatis dilatatis sublignosisque in base connatis, in sicco rugosis, parte basali styli crassi (2 mm longo) protrudento.

Type: *Corner SFN* 29430, 14 May 1935, Johore, 13½ mile Mawai-Jemaluang Road. Holotype in SING.

Also examined:

JOHORE: 13 mile Mawai-Jemaluang Road. *Corner* s.n. 31 Dec. 1934; 21 mile Mersing-Kota Tinggi Road. *KEP* 70811; Jemaluang F. R. *FRI* 2773, *KEP* 69992, *KEP* 71895. SOUTH PAHANG: G. Lesong F. R. *KEP* 83464, 86903.

Probably the huge woody fruits 7 cm across (at KEP), collected without leaves as *KEP* 79193 from G. Lesong F. R. compt. 20, are this. All the collections cited except the type are at KEP only and all are sterile twigs or fallen leaves except *KEP* 69992 in flower.

I name this fine tree in honour of the Forest Botanist at Kepong Mr. K. M. Kochummen. It is common in east Johore and the adjacent part of Pahang. Corner,

in making the collection I have chosen as type, noted '2½ hrs of sheer cutting to fell this tree . . . wood exceedingly hard, like iron, as "penaga"' and that it is common on hillocks and drier parts of swamp around Sg. Kayu Ara and Sg. Buloh Kasap.

Mesua kunstleri (King) Kostermans Reinw. 7 (1969) 427.

Kayea kunstleri King J. As. Soc. Beng. 59 (1890) 182; basionym.

Kayea rivulorum Ridley J. As. Soc. Str. Br. 54 (1909) 22. **syn. nov.**

Mesua rivulorum (Ridley) Kostermans loc. cit. 429, **syn. nov.**

King described his *Kayea kunstleri* in the Materials from four collections: *King's Collector* 3301, 6850, *Curtis* 1419 and *Maingay* 176. I have seen sheets of the first three of these syntypes at Singapore.

I have no doubt that Ridley's *K. rivulorum* belongs here, although it is known only from two syntypes, both in fruit, whereas all the collections I have seen of *M. (K.) kunstleri* are sterile or in flower. The argument for this conclusion is deferred until after the emended description of *M. kunstleri* var. *curtisii* below.

In describing *K. kunstleri* in the *Materials* King noted 'a shrubby form of this occurs in Penang (*Curtis*, Nos. 805, 1418) and in Perak (*King's Collector*, No. 1345) in which all the parts are smaller and the leaves are less acuminate at the apex, and rounded instead of much attenuated at the base'. I have seen (also at Singapore) the two *Curtis* numbers and confirm King's description.

In 1894 in another publication, King raised the Penang form to species status as *Kayea curtisii* based on one of the sheets cited in the *Materials*, *Curtis* 805, plus another collection *Curtis* 748, which I have also seen at Singapore, and which is a good match. He made several serious mistakes in his description in firstly saying 'leaf . . . base acute' whereas it is rounded, secondly 'flowers . . . leaf opposed', whereas they are actually terminal, and thirdly 'petals slightly smaller than the sepals', whereas actually they are twice as long. The earlier note in the *Materials* and the syntypes clearly show however what was intended by *K. curtisii*. Ridley in *Flora* 1 (1922) 191 sunk *K. curtisii* into *K. kunstleri* commenting that *Curtis* 1418 (of King's original note) is 'obviously the same plant' (? taxon) as *K. curtisii*, yet retained under *K. kunstleri* by King.

Since 1890 numerous additional collections have been made, all from Penang and Kedah. King's original note is amply confirmed, that there are two distinguishable taxa, the extreme forms being very distinct. There are however few substantial differences, and the placing of a few collections has to be rather arbitrary. Nevertheless I think it convenient and useful to give recognition to the 'shrubby Penang form'. I therefore accordingly reduce *K. curtisii* to varietal status. The necessary formulation is set out below with a new latin diagnosis, necessary because of King's mistakes.

Mesua kunstleri (King) Kostermans var. *curtisii* (King) Whitmore **stat. nov.**

Kayea curtisii King Ann. Bot. Gard. Calcutta 5 (1896) 144, t. 174B basionym.

Mesua curtisii (King) Kostermans Reinw. 7 (1969) 426. **syn. nov.**

A varietas typica in *foliis* minoribus, basi rotundato, nervis lateralibus abaxialis obscurioribus, differt.

Lectotype *Curtis* 805.

Although, as noted above, I have seen no fruiting collections of *M. kunstleri* I have seen several of *M. kunstleri* var. *curtisii*. These have the fruit wall thin but not brittle, smooth, and irregularly covered with tiny, fawn, corky scales; the fruits are mostly round, tipped by the 1–2 mm long style base, the largest is 3.3 cm across. The fruit is seated on the persistent sepals which are not enlarged. Both syntypes of *Kayea rivulorum* Ridley are in fruit, young in Ridley 7349, and, in Goodenough 1976, 4.5 cm long and ellipsoid, including a stout 1 cm apical beak. The wall is wrinkled and bears the same tiny scales typical of *M. kunstleri* var. *curtisii*. These fruits differ from those of *M. kunstleri* var. *curtisii* in drying wrinkled and in their shape. King, in his description of *M. kunstleri* and later as plate 173 in Ann. Roy. Bot. Gdn. Calcutta 5 (1896), depicts fruits of this shape, and there is a single Curtis collection of *M. kunstleri* var. *curtisii* at Singapore with neither number nor date which has them (this sheet I have labelled X). I consider the resemblance in fruit and leaf adequate to justify reduction of *K. rivulorum*. The types of *K. rivulorum* have the leaf base slightly rounded, whereas in the types I have seen of *K. kunstleri* it is long cuneate (and is thus described in the type description and depicted in plate 173 in Ann. Roy. Bot. Gard. Calcutta 5, 1896). There are 3 collections of Curtis 5571 at Singapore, of these 2 have cuneate and one slightly rounded leaf bases. All are dated March 1901 and all bear flowers. I think in this case we can assume they come from a single gathering of one tree, though Curtis often did place different gatherings under one number. Amongst the other abundant material at Kepong and Singapore this character breaks down. I do not think the shape of the leaf base is useful in this case to distinguish two taxa.

M. kunstleri is in many respects a coarse kind of *M. elegans* with bigger leaves and flowers. It differs from *M. nervosa* (in the circumscription of which I have been assisted by manuscript notes made by Symington at Kew) in the lack of harsh red tomentum. Monographic study is necessary to delimit more closely these two species.

Mesua lepidota Anderson Fl. Brit. Ind. 1 (1874) 278. KING J. As. Soc. Beng. 59 (1890) 185.

Anderson based *M. lepidota* on Griffith (K.D.) 845 from Malacca. King added *Scortechini 183b* and *King's Collector 4551, 5881*, recording that these differ in smaller leaves, more slender twigs and slightly thinner pericarp. He went on to note that these collections might be a second species, also possessing the very remarkable woody reflexed fruiting calyx which had prompted Anderson to suggest his species was 'probably a new genus between *Kayea* and *Mesua*'.

The abundant gatherings which have now been made show there clearly are two taxa, but a few collections are intermediate (*KEP 32163, 71830, 76734, FRI 11321*). It is convenient to give a name to the delicate form especially as it is very similar in the sterile state to *M. nuda*; the two are common together in the Ulu Gombak F. R. None of the cited material is represented in the Far East. Symington however has matched *KEP 12906* to Griffith 845 and *KEP 37290* to the slender variety.

In fact, I believe, from examination of *Burn-Murdoch* (=CF=FMS=KEP) 382, the single sheet extant of *Kayea parviflora* Ridley (kindly loaned to me at Kepong by Kew) that this little known taxon is the same thing in young flower bud, and it therefore provides the epithet for the variety, as follows:

Mesua lepidota var. **parviflora** (Ridley) Whitmore stat. nov.

Kayea parviflora Ridley J. As. Soc. Str. Br. 82 (1920) 170, basionym.

Mesua parviflora (Ridley) Kostermans Reinw. 7 (1969) 428 **syn. nov.**

Type: *Burn-Murdoch* 382 (at K).

Also examined (at KEP and SING):

PERAK: *FRI* 11937. TRENGGANU: *Corner* s.n. 9 XI 35, *SFN* 30480. SELANGOR (all Ulu Gombak): *KEP* 10919, 13064, 12633, 12855, 37290, 93292, 94717, 94718, *FRI* 1154, *Hume* 9270. MALACCA: *Derry* 63, 902, collection ∞ (at SING, no name or date). JOHORE, G. Blumut: *SFN* 10790.

In the Perak collection the fruit is young and has not developed a woody calyx. The Johore collection has the leaves 5×1 cm and broadest near the base with a long narrowed upper portion. These collections may represent slightly divergent populations. The Trengganu collection, *SFN* 30480, is the only one I have seen of the variety with the flowers in racemes.

The collections I have examined suggest the typical variety inhabits plains, and var. *parviflora* is a tree of the hills. The four intermediate collections cited all come from hilly places.

***Mesua nivenii* Whitmore sp. nov.**

A *M. wrayi* valde simillime sed in floribus sessilibus et foliis infra conspicue reticuloso-venulosis differt.

Arbor parva, *foliis* ovato-oblongis, c. 9×4 cm, basi late-cuneatis, apice acutis, coriaceis, nitidis, nervis lateralibus subtus tenuibus prominulentibus; pagine infra reticulato, nervis tertiariis valde approximatis, petiolo 1 cm longo ruguloso. *Inflorescentia* racemoso-paniculata, racemis ramificatis, pedunculis 1 cm longis, pedicellis obsoletis (floribus sessilibus) trifloriferis, sepalis ovatis rotundatis convexis in sicco nigris rugosis 6 mm longis, petalis c. 10×6 mm obovatis rotundatis, staminibus exsertis caespitosus. *Fructus* (submaturus?) includentibus in sepalis duobus paribus, sepalis maturitate incrassatis coriaceis rugosis turbinatis, parte basali stylo 2 mm protrudento.

Type: *Whitmore FRI* 12100, 12 July 1968. Trengganu, G. Mandi Angin, Summit ridge north of birop (trig. point), 1425 m. Holotype in KEP, isotypes K, L, SING, ARN. In flower.

Also examined:

TRENGGANU: leading E. ridge G. Mandi Angin: *FRI* 10815; G. Padang *SFN* 31064, 33909 (in fruit).

First collected by Moysey and Kiah on their pioneering journey up the Ulu Brang to G. Padang in 1937. Found in full flower by myself, and a delightful sight, on the summit ridge of G. Mandi Angin in 1968. Named for the part-time Superintendent of the first Singapore Botanic Garden who 'had a fine eye for design' (Purseglove).

***Mesua nuda* Kostermans ex Whitmore sp. nov.**

Arbor, ramulis gracilibus teretibus plerumque griseis, *foliis* ellipticis (5×1.5) – 6×2 – 8×3 cm, base cuneatis, apice cuspidatis, subcoriaceis, nervis lateralibus utrinque tenuissimis approximatis parallelis leviter arcuatis ex costa subperpendicularibus, petiolis gracilibus 3 mm longis. *Flores* (in alabastro) cum pedicellis 2 mm longis. *Fructus* solitarius, axillaris, pedunculo incrassato (a 5 mm), pedicello 2 mm longo, maturitate oblongo-ovoideis 4 cm longis 2.5 cm latis, apice interdum rostellatis, base rotundatis, paricarpio fructi tenuoso-fragile bubalino laeve squamulis minutis suberosis obtectis, sepalis caducis. Semen unicum in fructu, testa fusco nitido.

Type: *Whitmore FRI 3440*, 24 March 1967. Pahang, G. Benom, Ulu Sg. Krau, ridge crest 270 m. Holotype in KEP, isotypes K, L, SING, ARN.

Also examined:

KELANTAN: *KEP 98807, FRI 2333, 2339, 7255*. TRENGGANU: *SFN 30390, FRI 10682*. PAHANG: *KEP 4059, 29682, 100105, 108974, FRI 15333*. Baloh F. R.: *KEP 3149, 97913, FRI 3798*. KEDAH: *KEP 105354*. PENANG: *Curtis 748*. PERAK: *KEP 29928*; s.n. *Wyatt-Smith* 25 Jan. 1953. SELANGOR: *Hashim s.n. (SING), Burn Murdoch (KEP ?) 278 = 14248*. Ulu Gombak F. R.: *KEP 10942, 11220, 18163, 18165, 98401, FRI 2555*. MALACCA: (illegible) *851, Alvins 1066, Derry 1003* no locus; Symington *KEP 18163*. NEGRI SEMBILAN: *KEP 104871, FRI 11347*. JOHORE: *KEP 69996*.

Mesua nuda is a very common species, apparently endemic, which unfortunately has never been found in full flower. It is highly distinctive in its brittle, buff, naked fruits. The name is in wide usage but as far as I can discover Kostermans has never published it. Young fruits are sometimes globose, leaf size is slightly variable as is the clarity of the secondary nerves, but I have little doubt that all the collections cited belong to this species.

***Mesua purseglovei* Whitmore sp. nov.**

Arbor excelsa, *foliis* coriaceis lanceolatis, 13 × 4 cm, lamina prope basin quam apicem latiore, base rotundato, apice acuminatissimo; nervis lateralibus majoribus ex costa subperpendicularibus parallelibus leviter curvatis distaliter incurvato conjunctatis subtus conspicuis supra inconspicuis subdepressis, nervis lateralibus secundariis minoribus (1–3 aggregatis cum majoribus alternantibus) subtus inconspicuis, nervis tertiariis (reticulationis) evidentibus. *Flores* ignoti. *Fructus* solitarius (variter geminatus), axillaris, pedicello crasso 1 cm longo, pedunculo 4 cm longo, in sepalem ± inclusus (sepalis 4 maturitate valde dilatatis ovatis subcoriaceis furfuraceis depresso globosi diametro 3–3.5 cm).

Type: *Holtum SFN 31233*, 14 May 1936, Pahang, Cameron Highlands, mile 47 Telom Rd. Holotype in SING.

This is a high mountain species and I think likely to prove to be endemic. I therefore describe it, despite its being known from only one collection, in fruit. *M. purseglovei* is similar to *M. wrayi* but conspicuously differs in leaf characters.

XIX. LECYTHIDACEAE

T. C. WHITMORE

***Barringtonia payensiana* Whitmore sp. nov.**

Species nova, a speciebus omnibus generis *Barringtoniae* in fructibus pyramidalibus differt.

Arbor parva, *foliis* obovatis acuminatis chartaceis vel subcoriaceis, c. 21 × 6.5 – 50 × 14.5 cm, base longe decurrente, marginibus leviter revolutis, apicem versus leviter dissitiserratis, nervis lateralibus in paribus c. 26, petiolo 15 mm. *Inflorescentiae* et *flores* ignotae. *Fructus* pyramidata usque ad 4.5 cm lata, c. 4.5 cm longa, base omnino plano, plus minusve quadrata in sectione, superficie ruguloso, calyce persistenti usque ad 15 mm diametro.

SELANGOR: Ulu Batang Kali *FRI 4550* (holotype SING).

PERAK: Pangkor Island *SFN 31658*.

Named in honour of the recent monographer, Dr. J. P. D. W. Payens.

XX. LEGUMINOSAE (d)

T. C. WHITMORE

***Crudia viridiflora* Whitmore sp. nov.**

Arbor, foliis simplicibus subcoriaceis, glabris, oblonge-ovato, 15 × 6 – 22 × 8 cm, base cuneato, apice rotundato, apiculato, costa supra canaliculata, nervis lateralibus c. 9 paribus, pagina inferiore valde prominentibus, pagina superiore obscuris, nervis lateralibus secundariis reticulisve similiter, petiolo crasso rugoso 5 mm. Flores congesti, viridi, in racemos terminales, solitarios vel — 4 fasciculatos, 7–12 cm longi, rhachidi aureo pubescenti, bracteis minutis aureo tomentosis, pedicello 3 mm aureo tomentoso, sepalis ovoideis 6 × 4 mm exteriore ad basim leviter tomentosis, staminibus 8 exsertis, filamentis filiformibus 10 mm, ovario 5 mm longo aureo lanato, stylo gracili 5 mm. Fructus ignoti.

PAHANG: (G.) Lesong F. R., Sg. Jekatih *FRI 15949* (holotype KEP); *Samsuri 540*.

This distinctive new species was discovered too late for inclusion with the Leguminosae in vol. 1 of the *Tree Flora* and will have to go into a supplement later. It comes near to *C. gracilis* Prain apud King and *C. subsimplicifolia* Merr. in De Wit's monograph (*Bull. Jard. Bot. Buitenz. sér 3, 18, 1950 407–34*) but differs from both. It can easily be distinguished from all the other Malayan species from its simple leaves. I did not see any compound leaves on the limbs which were cut for me from the crown of the tree from which the type collection was made.

XXI. STROMBOSIA (OLACACEAE)

T. C. WHITMORE

***Strombosia maingayi* (Masters) Whitmore comb. nov.**

Anacolosa maingayi Masters Fl. Brit. Ind. 1 (1872) 580 basionym.

Strombosia rotundifolia King J. As. Soc. Beng. 64 (1895) 103 **syn. nov.**

Both names are based on the same type sheet, Maingay (Kew Distribution No. 1019), and the former clearly has priority. When King transferred Masters' species to *Strombosia* he incorrectly coined a new epithet for it. Ridley (*Flora* 1, 1922, 425) cites *A. maingayi* as a synonym of King's species.

***Strombosia multiflora* King J. As. Soc. Beng. 64 (1895) 102; syntypes Perak, King's Collector 7824; Penang, Curtis 859.**

King described this and his *S. rotundifolia* (see above) at the same time, noting that they are closely related. The name *S. multiflora* has never entered currency. The abundant material at Kepong and Singapore appears very homogeneous. I can see in it no significant difference in the three differential characters given by King, namely the number of flowers per cymose fascicle (the pedicels, it should be noted, are brittle and flowers easily break off), flower size (all have tiny flowers only c. 3 mm long, on a 1.5 mm pedicel), or leaf shape and size (King's contrast of rotund, 2.5 × 2 in., versus 2.5 × 1.5 – 4 × 2 in. seems in any case to be weak). There is variation between collections with sessile, round to oblong, fruits and those with stalked, round fruits. The former group has small, very woody fruits which might perhaps be galled.

Mr. L. L. Forman has kindly made a very thorough examination of the Kew material of *S. maingayi* (*rotundifolia*) and *S. multiflora*. Not one collection is in fruit. He could see no leaf or twig differences and the material was too incomplete to study the buds. He did however find a substantial difference in the flowers, along the lines indicated by King; to quote 'the Kew isotype of *Str. multiflora* has dense bunches of flowers with petals 5 mm long and styles 3.5 mm. *Str. rotundifolia* on the other hand has petals only half that length and a very short style less than 1 mm . . . These species are surely distinct'. He later reported that in both species the flowers have 1.5 – 2.0 mm pedicels. The Singapore isotypes which had been mislaid were subsequently rediscovered, examination of them confirmed Forman's careful observations.

The problem facing us in Malaya is thus a very tricky one. On the one hand, the two species appear to differ substantially in flower but the types are inadequate to discern any other differences. On the other hand, all the collections in the East (many of them duplicated at Kew) appear to represent one species, except Curtis 1371 from Pangkor Island, but they are mostly sterile or in fruit. That some collections have sessile fruits does not help as both species have pedicellate flowers, and in addition such fruits are suspected possibly to be galled.

Since King described *S. multiflora* no further collections have been added to the species, except Curtis 1371, just mentioned, which was misnamed '? *Anacolosa* sp.' Ridley in his Flora cites just the two syntypes. All the abundant material at Kepong and Singapore has been named *S. rotundifolia* (= *maingayi*). The few flowering collections amongst this abundance have the tiny flowers and short stigmas of *S. maingayi*, and are a good match for the fruiting and sterile collections.

I conclude that the pragmatic solution is to name all these collections *S. maingayi*. Although *S. multiflora* differs conspicuously in flower more collections than have been assembled in the last 76 years will be needed to discover if these two species can be differentiated in any other way. Thus, in summary, I propose to follow the practice since 1895, in putting our material into *S. rotundifolia*, but have had to revert to the earlier epithet for this taxon which becomes therefore *S. maingayi*.

Curtis 1371 from Lumut, Pangkor (Perak) at Singapore might represent *S. multiflora* in that the style is very long (4 mm) and thread-like, but the flowers are only 2 mm long.

XXII. HELICIOPSIS (PROTEACEAE)

K. M. KOCHUMMEN

Three new species of this small genus, only differentiated from *Helicia* in 1955, have been discovered in preparing the account for the *Tree Flora*.

Heliciopsis cockburnii Kochummen sp. nov.

Arbor ad 24 m alta, 60 cm diam., ramulis striatis junioribus ferrugineis, *foliis* (foliis pinnatisectis adhuc ignotis) ellipticis vel anguste obovatis, $9.5 \times 2.8 - 21 \times 7$ cm, apice obtuso, base angustato decurrenti, nervis lateralibus 6–11 paribus arcuatis, petiolo 1–4 cm longo base incrassato. *Flores* adhuc ignoti. *Infructescentiae* 10 cm longae rhachidi striata rubiginosa gracili 2 mm diam., bracteis linearibus 6 mm longis rubiginosis sub-persistentibus, bracteolis bracteis similibus 3 mm

longis, pedicellis 4 mm longis 2 mm crassis. *Fructus* oblonga nitida siccitate brunneola 2.5 cm longa 2 cm diam., stylo vestigio, exocarpio tenuissimo, mesocarpio radiato fibroso, 3 mm crasso, endocarpio tenuissimo. *Semina* leaves, testa brunneola.

PAHANG: G. Tapis 800 m *FRI 10934* (holotype KEP). PERAK: Keladang Saiong F. R. *KEP 2900*, *KEP 32181*. UPPER PERAK: *FRI 594*.

***Heliciopsis montana* Symington ex Kochummen sp. nov.**

Arbor 26 m alta, 60 cm diam., ramulis striatis cum cicatricibus foliorum delapsorum notati, *foliis simplicibus* coriaceis, ellipticis vel anguste oblongis, $(9 \times 3.5) - 15 \times 6 - 21 \times 10 - (40 \times 20)$ cm, apice obtuso, base cuneato raro inaequilatero, nervis lateralibus 6 - 10 (-14) paribus arcuatis, pagina supra nitida, petiolo 2 - 4.5 cm longo, ad base gibboso, *foliis pinnatisectis* $48 \times 24 - 54 \times 27$ cm, lobis 3-5 paribus oblongis $17 \times 3 - 19 \times 7$ cm, apice acuto, nervis lateralibus 9-11 paribus arcuatis, petiolo 10-13 cm longo. *Flores* adhuc ignoti. *Infructescentiae* rhachidi crassa 5 mm diam. striata ferruginea, bracteis adhuc ignotis (? cadicis), pedicellis crassis 6 mm longis 3 mm diam. *Fructus* siccitate purpurea vel brunneola oblonga 2.8 - 3.8 cm longa $\times 2.5 - 3.5$ cm diam., exocarpio coriaceo tenuissimo, mesocarpio fibroso 3 mm crasso, endocarpio tenuissimo leavis.

PAHANG: Fraser's Hill *FRI 16172* (holotype KEP). Cameron Highlands *KEP 27194*, *30966*, *SFN 32871*. PERAK: G. Korbu *KEP 32248*.

A species of mountain forests at 300 m and above. Endemic. Symington named this *Helicia montana* in manuscript.

***Heliciopsis whitmorei* Kochummen sp. nov.**

Arbor 18-21 m alta, trunco usque ad 40 cm. diam., ramulis striatis, junioribus ferrugineis, *foliis simplicibus* coriaceis ellipticis vel oblongis $7.5 \times 2.5 - 21 \times 7$ cm, siccitate viridiflavis, apice acuto, base acuto, nervis lateralibus 9-12 paribus, arcuatis, utrinque inconspicuis, costa supra conspicua, petiolo 2-5 cm longo base incrassato, *foliis pinnatisectis* $46 \times 28 - 60 \times 30$ cm, lobis c. 11 paribus, oppositis, $12.5 \times 2 - 15 \times 3$ cm, petiolo 9-14 cm longo. *Flores* adhuc ignoti. *Infructescentiae* 15 cm longae, rhachidi striata glabra 3-4 mm diam. *Fructus* cylindrico-truncata 18-20 mm longa 8-11 mm lata, stylo persistenti 1 mm longo, exocarpio tenuissimo, mesocarpio radiato fibroso 1 mm crasso, endocarpio 0.3 mm crasso.

TRENGGANU: G. Mandi Angin *FRI 12062* (holotype KEP). Ulu Sg. Trengganu 900 ft *FRI 10544*. Ulu Bendong Kemaman, 700 ft *SFN 30193*.
